

## INTERNATIONAL SEARCH REPORT

International application No. PCT/IB 2003/004310
---

## A. CLASSIFICATION OF SUBJECT MATTER

**IPC7: H03M 7/42, G06T 9/00**

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

**IPC7: H03M, G06T, H04N**

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

**SE,DK,FI,NO classes as above**

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**EPO-INTERNAL, WPI DATA, PAJ, INSPEC**

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Ji-Han Jiang et al "An Efficient Huffman Decoding Method Based on Pattern Partition and Look-up Table" Communications, 1999. APCC/OECC'99. Fifth Asia-Pacific Conference on...and Fourth Optoelectronics and Communications Conference page(s):904-907, Vol. 2, 1999, see paragraph 2.1 and 2.2, figure 1-3  --	23-25
A	Kuo-Liang Chung et al "Level-Compressed Huffman Decoding" IEEE Transactions on Communications, Vol. 47, No.10 Oct. 1999, Page(s): 1455-1457 ISSN: 0090-6778 See abstract  --	1-39

 Further documents are listed in the continuation of Box C. See patent family annex.

\* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search

5 February 2004

Date of mailing of the international search report

19-04-2004

Name and mailing address of the ISA/  
Swedish Patent Office  
Box 5055, S-102 42 STOCKHOLM  
Facsimile No. + 46 8 666 02 86Authorized officer  
Markus Stålö/mj  
Telephone No. + 46 8 782 25 00

## INTERNATIONAL SEARCH REPORT

International application No. PCT/IB 2003/004310
---

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>Seung Bae Choi et al "HIGH SPEED PATTERN MATCHING FOR A FAST HUFFMAN DECODER"            Consumer Electronics, IEEE Transactions on            14 Nov. 1994            Page(s): 97-103            ISSN: 0098-3063            See abstract</p> <p>---</p>	1-39
A	<p>Reza Hashemian "Memory Efficient and High-Speed Search Huffman Coding"            IEEE Transactions on Communications, Vol. 43,            No. 10, Oct. 1995            Page(s): 2576-2581            See abstract</p> <p>---</p>	1-39
A	<p>Hong-Chung Chen et al "A memory-efficient and fast Huffman decoding algorithm"            Information Processing Letters 69 (1999) 119-122            See abstract</p> <p>---</p>	1-39
A	<p>Byeong-Il Kim et al "An Efficient Search of Binary Tree for Huffman Decoding Based on Numeric Interpretation of Codewords"            ITC-CSCC-2002, The 2002 International Technical Conference, 16-19 July 2002, Phuket, Thailand            See abstract</p> <p>---</p>	1-39
A	<p>Manoj Aggarwal et al "EFFICIENT HUFFMAN DECODING"            Image Processing, 200. Proceedings: 200 International Conference on            10 -13 Sept. 2000            Page(s) 936-939            See abstract</p> <p>---</p>	1-39

## INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB 2003/004310

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Rezaul Alam Chowdhury et al "An efficient decoding technique for Huffman Codes" Information Processing Letters, 2002 Vol. 81, No. 6 Page(s): 305-308 See abstract --	1-39
A	Bai-Jue Shieh et al "A High-Throughput Memory-Based VLC Decoder with Codeword Boundary Prediction" Circuits and Systems for Video Technology, IEEE Transactions on, Vol. 10, No. 8, Dec. 2000 ISSN: 1051-8215 See abstract --	1-39
A	US 6188797 B1 (RIAZ A. MOLEDINA ET AL), 13 February 2001 (13.02.2001), abstract --	1-39
P,A	EP 1341314 A2 (SAMSUNG ELECTRONICS CO. LTD.), 3 Sept 2003 (03.09.2003), abstract -- -----	1-39

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IB 2003/004310

### Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.: **40 - 41**  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  
**see next page**
  
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

#### Remark on Protest

- The additional search fees were accompanied by the applicant's protest.  
 No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IB 2003/004310

Continuation of Box II, 2.

It is clear from the description on pages 7-15 that the following features are essential to the definition of the invention:

(1) a Huffman coding tree of height H (2) a first data structure (3) a second data structure etc.

Since independent claim 40,41 does not contain these features it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

24/12/2003

International application No.

PCT/IB 2003/004310

US 6188797 B1 13/02/2001 NONE

---

EP 1341314 A2 03/09/2003 CN 1441555 A 10/09/2003  
JP 2003273748 A 26/09/2003  
US 2003174076 A 18/09/2003

---